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10/511,170

10/14/2004

Tetsuo Kojima

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03/08/2006

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EXAMINER

LEE, JOHN D

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/511,170

Applicant(s)

KOJIMA ET AL.

Examiner

John D. Lee

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10/14/04 (preliminary amendment).
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12,14-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 3,13 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1004,0405</u> . | 6) <input type="checkbox"/> Other: _____  |

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. §§ 119(a)-(d) or (f). All copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

The twelve (12) sheets of drawing filed in this application on October 14, 2004, are acceptable.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claims 1 and 3 are objected to because of the following minor informalities: In the next-to-last line of amended claim 1, "ambients" should be "ambient"; and in the second line of amended claim 3, "ambient" should be "ambients". Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5, 7-10, 12, 14, 15, 17, and 18 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 6,002,697 to Govorkov et al. Govorkov et al discloses a wavelength converting method and apparatus involving passing light to be wavelength converted through nonlinear crystals (which can include crystals of CLBO (cesium lithium borate)), the crystals being maintained in an inert gas atmosphere such as 100% argon. Such an atmosphere clearly contains less nitrogen than air. Light enters and exits the gas filled housing through appropriate windows, while the argon gas is input, circulated, and exhausted (see Figures 6 and 7). Incident and output surfaces of the wavelength converting nonlinear crystals are in contact with the inert argon gas.

Claims 1, 2, 4, 5, 7, 8, 10, 12, 14, 15, 17, and 18 are further rejected under 35 U.S.C. § 102(b) as being clearly anticipated by published European Patent Application No. EP 1 048 974 A1 to Deki. Deki discloses a wavelength converting method and apparatus involving passing light to be wavelength converted through nonlinear crystals (which can include crystals of CLBO (cesium lithium borate)), the crystals being maintained in an inert gas atmosphere such as high purity oxygen, or a mixture of a rare gas and oxygen. Such an atmosphere clearly contains less nitrogen than air. As can be seen, light enters and exits the gas filled housing through appropriate windows, while the argon gas is input, circulated, and exhausted through gas inlets and outlets. Incident and output surfaces of the wavelength converting nonlinear crystals are in contact with the gas.

Claims 6 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,002,697 to Govorkov et al. Govorkov et al does not specifically disclose that the gaseous atmosphere contains no more than 10% by volume of nitrogen. In fact, the 100% argon atmosphere of the reference would most likely totally exclude nitrogen and meet this claim limitation. In any event, the limitation of 10% (by volume) or less nitrogen in the gaseous atmosphere of Govorkov et al would have been obvious to the person of ordinary skill in the art, since the intent of the reference is for use of 100% of the inert gas.

Claims 6 and 16 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over published European Patent Application No. EP 1 048 974 A1 to Deki. Deki does not specifically disclose that the gaseous atmosphere contains no more than 10% by volume of nitrogen. Since the reference, however, discloses only two possibilities for the gaseous atmosphere - high purity oxygen or a mixture of a rare gas and high purity oxygen – the person of ordinary skill in the art would have found it obvious to totally exclude nitrogen, certainly to an extent of no more than 10% by volume.

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,002,697 to Govorkov et al in view of U.S. Patent 5,862,163 to Umezu et al. Govorkov et al does not address the mean output power of the wavelength converted light. Umezu et al however, in a very similar type of wavelength converting device and method (i.e. passing light to be wavelength converted through nonlinear crystals (which can include crystals of CLBO (cesium lithium borate))), the crystals being maintained in

an inert gas atmosphere such as 100% argon), teaches that the mean output power of the wavelength converted light should be  $1 \text{ kW/cm}^2$  (well within applicant's claimed range). Since Govorkov et al and Umezu et al are so closely related, the person of ordinary skill in the art would have found it obvious to ensure that that the output powers disclosed in Umezu et al are present in the Govorkov et al apparatus and method.

Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,002,697 to Govorkov et al in view of U.S. Patent 6,381,255 to Van Saarloos et al. Govorkov et al does not disclose the use of the wavelength converting device in conjunction with a laser machining apparatus. Van Saarloos et al, however, which describes a very similar type of wavelength converting device (i.e. light to be wavelength converted is passed through nonlinear crystals (which can include crystals of CLBO (cesium lithium borate))), the crystals being maintained in an inert gas atmosphere such as 100% argon), specifically indicates laser machining (processing, ablating) as an end use for the conversion apparatus. Since Govorkov et al and Van Saarloos et al are so closely related, the use of the wavelength converting apparatus of Govorkov et al in conjunction with a laser machining device (as taught by Van Saarloos et al) would have been obvious to a person of ordinary skill in the art.

Claims 3, 13, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art documents of record, particularly those relied on in the rejections above, disclose or reasonably suggest having respectively different gaseous ambients on an incident

surface of a wavelength converting nonlinear optical crystal and on the output surface of the nonlinear optical crystal.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited U.S. Patents to Hauck et al, Asano et al, Partanen et al, and Shull all teach the use of nitrogen flushing or purging atmospheres for wavelength converting optical nonlinear crystals. This is the opposite of applicant's claimed invention.


All of the prior art documents listed by applicant in the Information Disclosure Statements filed on October 14, 2004, and April 29, 2005, including those documents relied on in the rejections above, have been considered and made of record (note the attached initialed copy of forms PTO-1449).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general

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or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562, to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or to the Technology Center 2800 Customer Service Office at telephone number (571) 272-1626.



**John D. Lee**  
**Primary Patent Examiner**  
**Group Art Unit 2874**